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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|-------------|----------------------|---------------------|------------------|
| 09/766,151 | 01/19/2001 | Terry M. Turpin | 509622000400 | 1278 |
| 25227 | 7590 | 04/04/2005 | EXAMINER | |
| MORRISON & FOERSTER LLP 1650 TYSONS BOULEVARD SUITE 300 MCLEAN, VA 22102 | | | WILSON, ROBERT W | |
| | | ART UNIT | PAPER NUMBER | 2661 |

DATE MAILED: 04/04/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

| | | | |
|------------------------------|------------------------|---------------------|--|
| Office Action Summary | Application No. | Applicant(s) | |
| | 09/766,151 | TURPIN ET AL. | |
| | Examiner | Art Unit | |
| | Robert W Wilson | 2661 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on 24 November 2004.
- 2a) This action is FINAL. 2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 1-13 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) Claim(s) _____ is/are allowed.
- 6) Claim(s) 1-13 is/are rejected.
- 7) Claim(s) _____ is/are objected to.
- 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on _____ is/are: a) accepted or b) objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) All b) Some * c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

PHIRIN SAM
PRIMARY EXAMINER

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____ | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| | 6) <input type="checkbox"/> Other: _____ |

Claim Rejections - 35 USC § 103

1.0 The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2.0 Claims 1-3 & 5-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Seo (U.S. Patent No.: 6,222,833 B1) in view of Garcia (U.S. Patent No.: 5,724,162)

Referring to claim 1, Seo teaches: a receiver (communication system) for multi user (Abstract or per col. 1 line 39) detection per Figs 1 & 2.

The reference teaches a plurality of processors each of which multiplies $S_{K(t)}$ with $r(t)$ and integrates for time period T which is performing correlation per Figs 1 & 2. $r(t)$ represents multiple users signals per Abstract or per col. 1 line 39 and $S_{K(t)}$ represents spreading codes per col. 1 lines 44-45 (hypothesized signals). The plurality of correlators produces a plurality of correlations (processor for correlating)

Each of the correlators is a one dimensional correlator. The plurality of correlators produce a vector of outputs or a multi-dimensional output array. The dimension of the vector has a dimension based upon the $S_{K(t)}$ (dimension based upon hypothesis) and a second dimension associated with $r(t)$ (dimension based upon correlation results)

11 per Fig 1 or 21 per Fig 2 performs a receiver algorithm for identifying sorting and separating the plurality of received signals based upon the plurality of correlations (algorithm) which results in interference being reduced per col. 1 line 14 or col. 2 lines 36-67.

Seo does not expressly call for: an optical correlator but teaches a correlator per Figs 1 & 2 respectively.

Garcia teaches: an optical correlator per Abstract or col. 1 lines 32-36.

It would have been obvious to one of ordinary skill in the art at the time of the invention to add the optical correlators of Garcia in place of the correlators of Seo because the optical correlators are faster and more cost effective to implement.

In Addition Seo teaches:

Regarding claim 2, The spreading codes $S_{K(t)}$ vary with time. It would have been obvious to one of ordinary skill in the art at the time of the invention that a controller is required in order to vary the codes with time.

Regarding claim 3, The reference teaches a plurality of correlators which when implemented together generate a two dimensional output correlation matrix per Figs 1 & 2.

Regarding claim 5, The reference teaches that interference is decreased per abstract. It would have been obvious to one of ordinary skill in the art at the time of the invention that because interference is another name for noise and the interference has been reduced that the signal to noise ratio would be enhanced.

Regarding claim 6, The reference teaches this is used to detect signals from multi users per Abstract or per col. 1 line 39)

Regarding claim 7, The applicant does not define what a multi user receiver algorithm is in the claim. The reference teaches that the Figs 1 & 2 are used to receive signals from multi users per Abstract or per col. 1 line 39; therefore, the examiner interprets this as a multi user receiver algorithm.

Regarding claim 8, The application does not define what a DS/SS CDMA communications system or a Multiple User Detection algorithm is in the claim. The reference teaches that the system is a DS-CDMA receiver for multiple users per Abstract; therefore, the examiner interprets this a DS/SS CDMA communication system for multiple users.

Referring to claim 9, Seo teaches: Figs 1 & 2 which perform methods which reduce the interference per Abstract or col. 1 lines 14 or col. 2 lines 36-67 or col. 3 lines 11-50 for multi users (Abstract or col. 1 line 39) (method)

10 per Fig 1 or 20 per Fig 2 receives $r(t)$ which consists of multi user signals per Abstract or per col. 1 lines 39 (receiving)

The reference teaches processors each of which multiplies $S_{K(t)}$ with $r(t)$ and integrates for time period T which is performing correlation per Figs 1 & 2. $r(t)$ represents multiple users signals per Abstract or per col. 1 line 39 and $S_{K(t)}$ represents spreading codes per col. 1 lines 44-45 (hypothesized signals). The plurality of correlators produces a plurality of correlations (plurality of correlations)

Each of the correlators is a one dimensional correlator. The plurality of correlators produce a vector of outputs or a multi-dimensional output array. The dimension of the vector has a dimension based upon the $S_{K(t)}$ (dimension based upon hypothesis) and a second dimension associated with $r(t)$ (dimension based upon correlation results)

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11 per Fig 1 or 21 per Fig 2 performs a receiver algorithm for identifying sorting and separating the plurality of received signals based upon the plurality of correlations (algorithm) which results in interference being reduced per col. 1 line 14 or col. 2 lines 36-67.

Seo does not expressly call for: an optical correlator but teaches a correlator per Figs 1 & 2 respectively.

Garcia teaches: an optical correlator per Abstract or col. 1 lines 32-36.

It would have been obvious to one of ordinary skill in the art at the time of the invention to add the optical correlators of Garcia in place of the correlators of Seo because the optical correlators are faster and more cost effective to implement.

In Addition Seo teaches:

Regarding claim 10, The applicant does not define a “complex signal-to-noise enhancement algorithm” in the claim. The reference teaches that interference is decreased per Abstract. It would have been obvious to one of ordinary skill in the art at the time of the invention that because interference is another name for noise and the interference has been reduced that the signal to noise ratio would be enhanced.

Regarding claim 11, The reference teaches this is used to detect signals from multi users per Abstract or per col. 1 line 39

Regarding claim 12, The applicant does not define what “a multi user receiver algorithm” is in the claim. The reference teaches that the Figs 1 & 2 are used to receive signals from multi users per Abstract or per col. 1 line 39; therefore, the examiner interprets this as a multi user receiver algorithm.

Regarding claim 13, The application does not define what a DS/SS CDMA communications system or a Multiple User Detection algorithm is in the claim. The reference teaches that the system is a DS-CDMA receiver for multiple users per Abstract; therefore, the examiner interprets this a DS/SS CDMA communication system for multiple users.

3.0 Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Seo (U.S. Patent No.: 6,222,833 B1) in view of Garcia (U.S. Patent No.: 5,724,162) further in view of Bloom (U.S. Patent No.; 5,311,360)

Referring to claim 4, the combination of Seo and Garcia teaches: The system of claim 1, The combination of Seo and Garcia does not expressly call for: comprising a converter for converting the plurality of received signals into a form suitable for input to the optical processor

Bloom teaches: modulator which converts electrical to optical signals per col. 1 lines 16-35.

It would have been obvious to one of ordinary skill in the art at the time of the invention to add the converter from electrical to optical signals of Bloom to the Optical correlator of the combination of Seo and Garcia because according to Bloom it is well known in the art to utilize the modular in conjunction with optical correlators for signal conversion.

Claim Objections

4.0 Claims 8 & 13 are objected to because of the following informalities: The examiner objects to usage of a slash between DS and SS because it is not clear whether the applicant is referring to DS and SS or DS or SS. Appropriate correction is required.

Response to Amendment

5.0 Applicant's arguments with respect to claims 1-13 have been considered but are moot in view of the new ground(s) of rejection.

Please refer to the above rejection for details.

6.0 Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Conclusion

7.0 Any inquiry concerning this communication or earlier communications from the examiner should be directed to Robert W Wilson whose telephone number is 571/272-3075. The examiner can normally be reached on M-F (8:00-4:30).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chau T. Nguyen can be reached on 571/272-3126. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Robert W. Wilson
Robert W Wilson
Examiner
Art Unit 2661



PHIRIN SAM
PRIMARY EXAMINER

RWW
3/30/05